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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/032,949

12/26/2001

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10416-18

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10/01/2008

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EXAMINER

ROJAS, MIDYS

ART UNIT

PAPER NUMBER

2185

MAIL DATE

DELIVERY MODE

10/01/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/032,949	<b>Applicant(s)</b> MUKAIDA ET AL.	
	<b>Examiner</b> MIDYS ROJAS	<b>Art Unit</b> 2185	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 7/9/08 have been fully considered but they are not persuasive.

In page 6 of the remarks, applicant argues that Hiraka does not teach "determining means for determining whether a first page of a page or pages corresponding to the host address... is either one of the searched start page and a page located after the searched start page or not" because a start page (wherein applicant's remarks describe a start page as a page where data is written) is not the same as an empty block. The examiner disagrees.

Hiraka discloses search means for searching a start page, in the physical block corresponding to the host address supplied from the host computer (searching the table in response to commands from the host computer, Col. 4, lines 59-67; table search means, Claim 1, Col. 17, lines 8-34 wherein the table search means searches for a host address corresponding to an empty state block); and

determining means for determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not (detection of the memory position of an empty block based on indicative data stored in one of the memory positions of the table memory, Claim 1, Col. 17, lines 8-34).

In the system of Hiraka, the searching of an empty state block is equivalent to searching for a start page since, as defined by applicant, a start page is the first free

page of a collection of free pages within a block (Page 19, lines 4-13 of specification). In finding the address of an empty block, the system of Hiraka is finding the location of the first page of the free block, thus constituting a start page. In detecting an empty block based on the address data, the system of Hiraka is determining that the first page of the empty block is a start page since it is the first free page of a collection of free pages within the free block. Hiraka is additionally identifying empty pages located after the start page since the entire block is empty, thus, the pages preceding the start page within the same block are also empty.

In page 7 of the remarks, applicant argues that Hiraka does not teach “start page information means which writes start page information into a redundant area of the start page...”. The examiner disagrees.

Hiraka discloses start page information write means which writes start page information into a redundant area of the start page which is searched by the search means (redundant region of each block is divided into fields for storing block status information such as “empty block status”, Col. 5, lines 29-36; the empty block table is initialized using information in the redundant region of each block, Col. 7, lines 24-40; the empty block table is updated during the write, Col. 11, lines 48-51).

### ***Claim Objections***

2. Claim 21 is objected to because of the following informalities:

In line 6, the phrase “...in the physical block” should be changed to “...in a physical block”.

In lines 8-9 and line 15, the phrase “a first page of a page or pages” should be changed to “a first page or a page of pages”.

Appropriate correction is required.

3. Claim 23 is objected to because of the following informalities:

In line 7, the phrase “...whether first page or a page or pages” should be changed to “...whether a first page or a page of pages”.

In line 18, the phrase “...at a time when starting writing data” should be change to “...at a time when starting to write data”.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

4. The rejection of Claim 21 under 35 USC 101 is being withdrawn in view of applicant's remarks and further in view of applicant's amendments. The examiner would like to point that amended claim 21 includes both a controller and a memory that is embodied in hardware (paragraph 066 of the specification).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 21-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiraka (5,987,573).

Regarding Claim 21, Hiraka discloses a memory controller (Figure 1, controller 10) for accessing a flash memory (Figure 1, Flash memory FM 0-n) having a plurality of physical blocks each including a plurality of pages (flash memories are divided into a plurality of blocks, each block is divided into a plurality of pages or sectors, Col. 5, lines 15-20) and in which stored data is erased in a unit of the physical block (erasing is performed in units of a block, Col. 5, lines 22-23), based on a host address which is in unit of a sector supplied from a host computer (the block indicated by a write command, send by the host, is erased, Col. 9, lines 24-32), comprising:

search means for searching a start page, in the physical block corresponding to the host address supplied from the host computer (searching the table in response to commands from the host computer, Col. 4, lines 59-67; table search means, Claim 1, Col. 17, lines 8-34 wherein the table search means searches for a host address corresponding to an empty state block). In the system of Hiraka, the searching of an empty state block is equivalent to searching for a start page since, as defined by applicant, a start page is the first free page of a collection of free pages within a block (Page 19, lines 4-13 of specification). In finding the address of an empty block, the system of Hiraka is finding the location of the first page of the free block, thus constituting a start page;

determining means for determining whether a first page of a page or pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not (detection of the memory position of an empty block based on indicative data stored in one of the

memory positions of the table memory, Claim 1, Col. 17, lines 8-34). In detecting an empty block based on the address data, the system of Hiraka is determining that the first page of the empty block is a start page since it is the first free page of a collection of free pages within the free block. Hiraka is additionally identifying empty pages located after the start page since the entire block is empty, thus, the pages preceding the start page within the same block are also empty;

write means for writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when the determining means determines that the first page of a page or pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page (using detected empty block to write new data, Col. 1, lines 45-67; writing command, Col. 9, lines 40-67 wherein the empty block is an indication of the start page as claimed); and

start page information write means which writes start page information into a redundant area of the start page which is searched by the search means (redundant region of each block is divided into fields for storing block status information such as "empty block status", Col. 5, lines 29-36; the empty block table is initialized using information in the redundant region of each block, Col. 7, lines 24-40; the empty block table is updated during the write, Col. 11, lines 48-51), the start page information (written into the redundant region and the empty block table) representing a page which is next to a last page of the page or pages into which data will be written by the write means (after the searched empty block that represents a start page is found and a write

to that block is initiated, the system searches for the next empty block using the block status information in the empty block table, Col. 12, lines 8-45) and become a new start page after the data is written by the writing means (once the next empty block is found, it is designated as the next start page since it is the next position into which data will be written; in the case of Hiraka, the address of the next start page is word address 20H of which the block corresponding to memory position 101 is identified as the next empty block; Col. 12, lines 8-45);

wherein the start page being a page next to the last page of a page or pages into which the data supplied from the host computer is written (the next empty block represented by memory position 101 is written to and its empty state is set to a value of "0", Col. 12, lines 15-40); and

the search means searching the start page by referring the start page information written in the redundant area (the start page is searched for in the empty state table, see Col. 12, lines 8-45 and Figure 6 showing the empty block table; wherein the empty state table is representative of the contents of the redundant region, see Col. 7, lines 24-30. Thus, in searching the empty state table, the system is searching through the information that is written in the redundant region).

Regarding Claim 22, Hiraka discloses a flash memory system (Figure 1) having a flash memory (FM0) and the memory controller (Figure 1, 10) as set forth in Claim 21.



Regarding Claim 23, Hiraka discloses a memory control method (Figure 1, controller 10) for accessing a flash memory (Figure 1, Flash memory FM 0-n) having a plurality of physical blocks each including a plurality of pages (flash memories are divided into a plurality of blocks, each block is divided into a plurality of pages or sectors, Col. 5, lines 15-20) and in which stored data is erased in a unit of the physical block (erasing is performed in units of a block, Col. 5, lines 22-23), based on a host address which is in unit of a sector supplied from a host computer (the block indicated by a write command, send by the host, is erased, Col. 9, lines 24-32), comprising:

searching a start page, in the physical block corresponding to the host address supplied from the host computer (searching the table in response to commands from the host computer, Col. 4, lines 59-67; table search means, Claim 1, Col. 17, lines 8-34 wherein the table search means searches for a host address corresponding to an empty state block). In the system of Hiraka, the searching of an empty state block is equivalent to searching for a start page since, as defined by applicant, a start page is the first free page of a collection of free pages within a block (Page 19, lines 4-13 of specification). In finding the address of an empty block, the system of Hiraka is finding the location of the first page of the free block, thus constituting a start page;

determining whether a first page or a page of pages corresponding to the host address supplied from the host computer is either one of the searched start page and a page located after the searched start page, or not (detection of the memory position of an empty block based on indicative data stored in one of the memory positions of the table memory, Claim 1, Col. 17, lines 8-34). In detecting an empty block based on the

address data, the system of Hiraka is determining that the first page of the empty block is a start page since it is the first free page of a collection of free pages within the free block. Hiraka is additionally identifying empty pages located after the start page since the entire block is empty, thus, the pages preceding the start page within the same block are also empty;

writing data supplied from the host computer into the page or pages corresponding to the host address supplied from the host computer when the determining means determines that the first page or a page of pages corresponding to the host address supplied from the host computer is the searched start page or the page located after the searched start page (using detected empty block to write new data, Col. 1, lines 45-67; writing command, Col. 9, lines 40-67 wherein the empty block is an indication of the start page as claimed); and

writing start page information into a redundant area of the start page at a time when starting to write data supplied from the host computer into the flash memory (redundant region of each block is divided into fields for storing block status information such as "empty block status", Col. 5, lines 29-36; the empty block table is initialized using information in the redundant region of each block, Col. 7, lines 24-40; the empty block table is updated during the write, Col. 11, lines 48-51), the start page information (written into the redundant region and the empty block table) representing a page which is next to a last page of the page or pages into which data will be written by the write means (after the searched empty block that represents a start page is found and a write to that block is initiated, the system searches for the next empty block using the block

status information in the empty block table, Col. 12, lines 8-45) and become a new start page after the data is written by the writing means (once the next empty block is found, it is designated as the next start page since it is the next position into which data will be written; in the case of Hiraka, the address of the next start page is word address 20H of which the block corresponding to memory position 101 is identified as the next empty block; Col. 12, lines 8-45);

wherein the start page being a page next to the last page of a page or pages into which the data supplied from the host computer is written (the next empty block represented by memory position 101 is written to and its empty state is set to a value of "0", Col. 12, lines 15-40); and

the start page being searched based on the start page information by referencing the data written in the redundant area (the start page is searched for in the empty state table, see Col. 12, lines 8-45 and Figure 6 showing the empty block table; wherein the empty state table is representative of the contents of the redundant region, see Col. 7, lines 24-30. Thus, in searching the empty state table, the system is searching through the information that is written in the redundant region).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIDYS ROJAS whose telephone number is (571)272-4207. The examiner can normally be reached on M-TH 6:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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